

CLAIMS

What is claimed is:

- 1                    1.     A method of coating a substrate, comprising:  
 2                                providing a substrate having a surface;  
 3                                forming a polymeric layer on the surface of the substrate by applying  
 4                                a layer of a polymeric precursor to at least a portion of the surface;  
 5                                polymerizing the polymeric precursor to form a polymerized layer; and  
 6                                applying a metal coating to at least a portion of the polymerized layer;  
 7                                wherein the metal coating is applied under sub-atmospheric conditions.

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- 1                    2.     The method of claim 1, wherein the step of applying the layer of the  
 2                                polymeric precursor is performed using an electrophoresis process.

- 1                    3.     The method of claim 2, wherein the step of forming the polymerized  
 2                                layer includes elevating the temperature of the polymeric precursor to a temperature  
 3                                of at least about 320°F.

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- 1                    4.     The method of claim 2, wherein the polymeric precursor is selected  
 2                                from the group consisting of acrylics, epoxies, urethanes, and combinations thereof.

- 1                    5.     The method of claim 1, wherein the substrate is porous, and further  
 2                                comprising leveling the surface of the substrate before the step of applying the metal  
 3                                coating.

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- 1                    6.     The method of claim 5, wherein the metal coating is applied using a  
 2                                physical vapor deposition method.

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1           7.     The method of claim 6, further comprising the step of removing a  
2     portion of the polymerized layer before applying the metallic coating.

1           8.     The method of claim 7, further comprising cleaning at least the  
2     polymerized layer before the step of removing a portion of the polymerized layer.

1           9.     The method of claim 6, wherein the metal coating is applied in a  
2     pressure range of about  $5 \times 10^{-4}$  millitorr to about  $2 \times 10^{-5}$  millitorr.

1           10.    The method of claim 6, wherein the metal coating is applied by  
2     evaporation.

1           11.    The method of claim 3, further comprising maintaining the polymeric  
2     precursor at the temperature for at least about 12 minutes.

1           12.    A method of coating a surface, comprising:  
2                    providing a substrate;  
3                    coating at least a portion of the substrate with a layer of an  
4     electrophoretically applied polymeric precursor;  
5                    polymerizing the polymeric precursor to form a first polymeric coating;  
6     and  
7                    elevating the temperature of the polymeric coating to at least about  
8     400°F for at least about 6 minutes.

1           13.    The method of claim 12, further comprising applying a layer of metal  
2     over at least a portion of the polymeric coating.

1           14.    The method of claim 13, further comprising applying a second  
2     polymeric coating over the layer of metal.

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3 15. A method comprising:  
4 forming a polymeric coating from an electrophoretically applied  
polymeric precursor and applying a layer of metal over the polymeric coating using  
a physical vapor deposition process.

1 16. An article having a porous surface, comprising:  
2 an electrophoretically applied first polymeric layer overlaying and in  
3 direct contact with the porous surface; and  
4 a metallic layer overlaying the first polymeric layer.

1 17. The article of claim 16, further comprising:  
2 a second electrophoretically applied polymeric layer overlaying and in  
3 direct contact with the metallic layer.

1 18. The article of claim 16, wherein the article is selected from the group  
2 consisting of plumbing fixtures, jewelry, and utensils.

1 19. The article of claim 17, wherein the article is selected from the group  
2 consisting of plumbing fixtures, jewelry, and utensils.

1 20. The article of claim 16, wherein the polymeric layer is a dielectric  
2 layer.

1 21. The article of claim 16, wherein the metallic layer is chrome.

1 22. The article of claim 16, wherein the first polymeric layer has a  
2 thickness ranging from about 1 millimeter to about 40 millimeters.

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1           23.    The article of claim 16, wherein the metal layer has a thickness ranging  
2           from about 0.1 millimeter to about 3 millimeters.

1           24.    The article of claim 23, wherein the second polymeric layer has a  
2           thickness ranging from about 1 millimeter to about 40 millimeters.

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